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CONTENTS.

SUMMARY: —
The Washington Monument. — The Superintendent of Buildings, New York. — The Brooklyn and the Blackwell's Island Bridges. — Houses for the Working-Class in Philadelphia. — Le Panthéon. — Correction 113
ARCHITECTS ON PROBATION 114
STUDIES OF INTERIOR DECORATION. V. 115
THE ILLUSTRATIONS: —
The Moreland Street Church. — Château St. Louis. — Interior Decoration. IV. 116
PROPOSED QUEBEC IMPROVEMENTS 116
THE CLOCK OF BEAUVAIS CATHEDRAL 117
COMMUNICATIONS: —
The Drainage of Country Houses. — The Chicago Custom House. — The Central Park, New York. — E. and O. E. . . 118
NOTES AND CLIPPINGS 120

REPORTS of the decision of the engineers who have been examining the foundations of the Washington Monument have been many, and each in direct opposition to its predecessor; but it appears that up to our date of writing no report has been rendered, and we see no evidence that anybody knows what the decision will be. Much as we sympathize with the feeling and purpose of those who would forward the undertaking, we earnestly hope, as the easiest way of sparing the country from a most unfortunate error and ultimately a serious mortification, that it will be found absolutely unsafe to continue it. At a meeting of the Monument Association last week, the Secretary gave account of a conversation which he and the Supervising Architect had with President Hayes on the subject. He said that the President expressed much concern about the monument, and was anxious to have the work on it immediately resumed, showing some feeling at the delay, and promising to do his utmost to forward the objects of the society. The President has the reputation of being a man of more culture than some of his predecessors; and we must believe that his earnestness in forwarding the present movement springs from his interest in the commemorative project rather than from any considerate approval of the unworthy design which the association is trying to press to completion. It is a misfortune that the issue has been put upon the country and upon Congress of building *the* Washington Monument instead of *a* Washington Monument. It is not likely that either the legislators who inconsiderately committed the government to taking it up again, or any considerable number of the million or two of people who will be called upon for their subscription, have formed a serious judgment of the propriety of the design that is foisted upon them as if no other could be found. But it is certain that the general voice of the architectural profession and of cultivated persons throughout the land who have considered the design condemns it unequivocally; and to have the newly awakened zeal of the people constrained to consummation of what would assuredly come to be regarded as a national folly, is a national misfortune, from which we trust the decision of the examining commission may deliver us.

CONSIDERABLE opposition has been made to a provision in a bill now before the New York Legislature which makes the Superintendent of Buildings of the City of New York subject to the approval of the American Institute of Architects, or its New York Chapter. The measure is one that has already been in force under a different law for a number of years; and though it does not seem to us of vital importance, it has some of the advantage of a safeguard. The superintendent of buildings of a large city had better be an architect; and considering how public appointments are often made for large cities, it is worth while to provide for a professional officer the security of some indorsement of his professional capability. We can think of no such security which could be provided for by statute except the approval of some recognized body in the profession to which he belongs. Among architects in the United States there is absolutely no association except the Institute, and therefore nowhere else to look for any professional guaranty. The approval of the Chapter of the Institute would not insure a satisfactory officer; but it would probably exclude an incapable or dishonorable one. The thing to be considered is not the advantage of the Institute or of architects outside the Institute, but of the city; and if the measure promises a safeguard of any kind to the city, it would seem to be worth preserving unless it entailed some counterbalancing evil, of which we see no sign here. We do not imagine that the Chapter would refuse to approve a man known to be qualified for the position because he was not one of themselves. As for the attitude of architects, it is true that the Chapter contains but a minority of the architects in New York, and that there are men of as much eminence in their profession among outsiders as among members; still it cannot be denied that of architects who are distinguished enough to have attracted the general acknowledgment of their fellows, there are more inside than out, and that the average standard both of attainment and of honorable practice is higher. Moreover, it is perfectly safe to say that there is not an architect in New York to-day, member or non-member, whose standing — if he has any — is not the better for what the Institute has done in behalf of the profession. The useful and reasonable thing for outsiders, we should say, would be to join the Institute themselves, and lend their hand to improving the state of the profession, and therewith their own. The policy of the Institute, and of the New York Chapter as far as we can judge, is not exclusive. They are glad to increase their number, and only ask of those who will join them that they shall show not an eminent but a reasonable professional capability, shall refrain from cutting each other's throats, and from receiving fees of anybody but their clients.

SINCE we have heard nothing lately of the protests and injunctions that have been proclaimed from time to time against the Brooklyn Bridge, we may presume that the shipowners who have opposed it are becoming convinced of the hopelessness of their opposition. It now looks as if the bridge would not long stand alone, if even it has not a companion by the time it is finished. The company which has been formed for building a bridge at the famous Blackwell's Island (three or four miles higher up East River), where the city penitentiary, workhouse, and insane-asylums are, selected a board of consulting engineers, Gens. Barnard and Gillmore and Mr. Chanute, and referred to them the decision between the plans that were offered. The engineers have reported that nine designs were submitted and examined, of which only two were suspension bridges pure and simple; another was a trussed cable, two were trusses (one of them a lattice truss), two hinged-arch bridges, one a "derrick," and one a "cantilever." Three prizes were awarded, of one thousand, five hundred, and two hundred and fifty dollars respectively. The first prize "for practical construction with such improvements and modifications as suggest themselves," was awarded, in accordance with the vote of a majority of the consulting engineers, to the design offered by Mr. Charles MacDonald for the Delaware Bridge Co.; the second was given to the hinged-arch project of Capt. Eads's design, offered by the Phœnixville Bridge Works; and the third to the "derrick" design submitted by Henry Flad and Co. of St. Louis. Gen. Barnard, it is said, however, offered a supplementary report in which he advocated Capt. Eads's plans as the best at all points.

BLACKWELL'S ISLAND divides the East River into two spans of upwards of six hundred and seven hundred feet respectively. The floor of the bridge is to be 135 feet above high water, and provision is to be made for a line of rail, two carriageways, and two foot-walks. Mr. MacDonald's design is for a form of what is called a "cantilever" bridge, consisting in each span mainly of two bracket-trusses, in general form like those used in swinging drawbridges, which, balanced on the land piers, nearly meet in the middle of the span. The land ends will be anchored into heavy abutments, and the outer ends overhanging the water for a length of 270 feet will leave in the wider span a gap of two hundred feet. The

bracket trusses can be carried out from the shores without interfering with the use of the river, and without the risks and difficulties which belong to the building of the Brooklyn Bridge; the gap will be spanned by an ordinary truss, which, built on one of the end-trusses already in place, can be rolled forward into position when it is ready. The bridge will be wholly of wrought iron, the piers being of truss work standing on a base of granite thirty feet above high water. The character of the shores and the comparative narrowness of the spans make this bridge an easier problem than that at Brooklyn, and it is expected that it can be finished in two years at a cost of two millions and a half of dollars.

At a meeting of the Social Science Association in Philadelphia last week, Mr. Lorin Blodgett read a paper on tenement-houses, and houses for the poorer classes; a subject which is receiving much and general attention nowadays. Mr. Blodgett spoke with natural warmth in favor of the system of building-associations that is characteristic of Philadelphia, which he thinks one of the greatest works of popular beneficence that the world has known. To say that a population of 850,000 has passed through the late hard times "with scarcely an instance of serious suffering," is the language of enthusiasm; but there is no doubt that the working-classes of Philadelphia enjoy exceptional advantages. Mr. Blodgett says that the building-associations now include nearly seventy thousand members, with an accumulating capital of thirty millions of dollars. These associations, it is estimated, have in about thirty years invested in real estate more than fifty millions of dollars, having received and invested in 1875 alone seven millions and a half. Forty-five hundred houses, averaging $3,500 each in cost, make nearly sixteen millions worth of building annually. The houses are usually built in one of three forms, — two-story houses of four rooms or of six rooms, or three-story houses of eight rooms. The first cost from $1,200 to $2,500, and rent for from $11 to $18 per month; the second from $2,500 to $3,800, renting for from $16 to $25; the third from $3,000 to $5,000, renting for from $20 to $35. From one hundred and twenty-five to one hundred and thirty are built on a square of 425 feet, worth from one hundred to one hundred and twenty-five thousand dollars (say sixty-five cents per foot), and probably cover half or more than half the surface. This arrangement Mr. Blodgett thinks to be more advantageous than the improved tenement-houses that are building in other cities. Whether it would be more wholesome would depend on the planning and administration of the tenement-houses, we should think; but it must obviously be more costly, and it hardly admits of making a city secure against fire. On the other hand it has the social and political advantage of encouraging and helping the working-men to own their own homes, an advantage not to be lightly discarded. Three-fourths of the houses, says Mr. Blodgett, are owned by their occupants by the time they have been built two years.

The famous Church of St. Geneviève at Paris, better known as the Panthéon, has become conspicuous of late days, beside the richly decorated modern churches and the still more richly restored old ones of the city, for the cold grayness of its interior. It is now proposed to decorate it with mural paintings, and further to ornament it with ten colossal statues in marble. The church — lighted by great lunettes which, set above the springing of the vaults behind the parapet of the roof, are invisible from without, and a standing puzzle to the visitor, who vainly scans the imperforate walls for them — is found too dark to allow of painting the subjects chosen for its decoration directly on the walls, and they will be executed in the artists' studios on canvas, which will afterwards be stretched on the walls; a method which has been adopted in the new Church of St. Augustine, and perhaps in others. The two lateral chapels are found, however, to be light enough for painting on the walls themselves; and here workmen are already busy preparing the surface on which it is expected that the artists will set to work in another month.

By a slip in our last number we put the price of Messrs. Prang & Co.'s "Parallel of Historical Ornament" at $10. It should have been $15.

ARCHITECTS ON PROBATION.

The indications of a certain unpopularity of the architectural profession in England, which are given by various remarks of public men and expressions of the architectural journals, to which we have called attention of late, show a state of things which we are glad to believe does not characterize our own country. It does suggest, however, some of the difficulties that beset our profession here as well as there, and it also brings into prominence the fact to which we alluded a little while ago, that this very state of things marks if it does not offer the architect's best opportunity. In the United States the rapid transition of a nation whose means were small, and its ways of living simple and frugal, into a wealthy and luxurious one, tempted to profusion and display, and growing in culture as well, with its habits of life, domestic, social, and even political, only half determined yet taking shape rapidly, has required that buildings shall be devised for it that are suited to that life and the luxury and culture at which it aims. The whole planning and arrangement of dwelling-houses, and in a great measure of public buildings, have in a generation past undergone changes which may almost be called revolutionary. The use of new materials too has brought new problems. Concrete, moulded, and ornamented brick, terra-cotta tiling, iron cast and wrought, and even sheet metal, have their important uses, and should have their appropriate forms and treatment. As yet they have not, and it belongs to the architects to find them.

Herein is the architect's opportunity. His hold on the public confidence will be just in proportion to his comprehension and satisfaction of its practical wants. Wherever architects do not do this themselves visibly and successfully (in England, if that be the case there), their hold on the public will be very slight. This will have very little to do with their success in any esoteric and technical or even artistic excellence, so long as the temper of the age remains as it is now. This is not an artistic age, whatever interest in matters of art may be stirring in it here and there. The way to its heart and its rewards is through practical and not artistic success; for any profession at least, whatever may be the good fortune of individuals. Architects who devote themselves to the pursuit of architectural elegance, to the neglect of the wants which their clients press upon them, are likely to be left alone to their own devices and the sympathies of the few connoisseurs and persons of elegant tastes whose aims are congenial to theirs. The world is full of enterprising men who stand ready to supply its wants: when architects neglect them, it is ready to turn to others. No architect who has read the past volume of our journal will accuse us of not giving due importance to the artistic side of his profession. It is, we have always maintained, the highest part; but it is not more essential than the homelier part, and it is the part that cannot stand alone. Architecture is, in fact, too practical an art to be conservative. It is only when the progress of design has waited closely upon the development of material wants, that it has developed vigorously, or has kept a hold on public interest.

That such an interest is very general now is evident enough. As far as amount of work done is concerned, the last fifty years may fairly be called one of the great building ages of the world. With us, in fact, it is our first building epoch; and the general interest in building is shown not only by the amount of work done, and the growth of the architect's profession, but by the increase of our professional literature, by the general demand for information on architecture and kindred arts, for magazine articles, books of popular architecture and decoration, and for architectural and decorative illustrations of all sorts. The interest is twofold, due not only to the fact that our people want houses, churches, buildings of all sorts, in greater number and of greater importance than ever before; but to the other fact that they are for the first time awakening to a great interest in art of all kinds, one which needs no proof. The concurrence of these two conditions is enough to make architecture, for the nonce at least, the most popular of arts, and to give architects such an opportunity as they may not have again here for a century or two; if they do not improve it to the good of architecture, and to their own profit, they will have no one to blame but themselves. They have in their hands at present the key to the whole position. Their train-

ing gives an advantage for dealing with practical wants which only negligence can forfeit, and the prevailing interest in art as a thing desired but not understood gives them a prestige on that side. It is true that there are difficulties in the way, that the supremacy of the trained architect is not to be maintained altogether without question. Among the uninstructed there is a natural tendency to believe that in art, as in politics, one man is as good as another; but people of this belief are open to conviction on the material side; and when the trained architect proves, as his training entitles him to prove, that he is better qualified than the "practical man" to deal with the problems of natural wants and material adaptations, confidence in his other attributes will follow readily. The architect can by virtue of his training, if he does his profession justice, build a house or other building better suited for its uses, more economical, more convenient, more securely and practically constructed, more comfortable, than any one else can build. If he cannot do this, and make it come to be confessed that he can do it, it is his own fault, and not the fault of his profession or his opportunities. Huxleys, Bentincks, Becketts, and Ruskins, to the contrary notwithstanding, it is his business to give compelling proof of this; and the able men who do give proof of it are not few, but many.

As a matter of fact architects have done a good deal, more perhaps than is credited to them, in inventing and adapting not only decorative but useful forms for our present building wants. All the changes in the planning of our dwelling-houses for city or country, which a generation has developed, are the work of architects, and mainly of that part of the profession which would most incur Prof. Huxley's distrust, namely, the men who have done the best work artistically also, and not by the men to whom a practical tendency or experience is ascribed. In the cities where, as in New York and Philadelphia, the planning of dwellings has been mainly in the hands of builders or of architects fledged from builders, the old stereotyped plans of a generation ago have been handed down, and in convenience as well as in elegance of arrangement the houses have lagged behind those of cities where architects have had more "swing." This is true not only of the distribution of plan, but of a hundred devices in the construction of houses and other buildings, by which they are made more comfortable, serviceable, and attractive, apart from their strictly architectural merits. It is greatly owing to this fact, partly recognized and partly unrecognized, that the employment of architects has become the rule, so that nowadays very few houses or other buildings of any importance are built anywhere in the country without the aid of some one who professes to be an architect. Architects in the United States at least not only need to be practical, but are so; and they have really accomplished pretty much all that has been accomplished — the technical improvement of the trades excepted, though of this a great deal is actually due to their influence — in improving the building of their country.

There is of course another side to the question. One meets here and there the notion, which seems to have a greater hold in England, that architects are an impracticable set; that they are negligent of, or do not understand, the arrangement and construction of their buildings, but spend all their effort and waste their clients' money in the adornment of them. There is the more unmanageable difficulty of the tendency to employ uneducated architects and quacks, and to expect to pay quack fees for architectural services. For the first of these notions there has been some foundation in the pretensions of a good many practitioners, especially in the days when the profession was becoming popular, who, finding that there was no fence about it to keep out anybody who chose to straggle into it, and coming in without any training for it, managed to discredit their brothers by doing a good deal of work in a very shiftless way. The second difficulty is one which besets all professions alike, and if architects suffer more from it than lawyers or physicians, it is that their profession is newer and less definitely organized than theirs, — partly too, that there being many things in an architect's work of which the client is a very capable judge, it is not unnatural that he should think himself a qualified judge of the whole, and so disparage the safeguard of professional standing. But since the architect has it in his power, if he will, to distance the merely "practical" men in the things in which alone they can acquire confidence, he has little reason to waste complaints on this trouble.

If therefore the position of our profession is in a degree undetermined, it is for us to determine it. There is no great danger that we shall fail to study the wants of the public. It will remind us in some unmistakable way if we neglect them. But as yet the public has not learned where to take us. It will not be likely to set any higher valuation on us than we set on ourselves. It may find us indispensable, but it will not give us any greater respect than is necessary. In the late debates in the New York Senate, on the appointment of an architect for the city of New York with the provision that he should have the approval of the Institute or its Chapter in that city, one senator said he should as soon think of consulting the Royal Society of Lollipops — whatever that may be; another said that so far as he could see, architects were always quarrelling, which, if it were true, would certainly be reason enough for not consulting them. A correspondent complained in our last number of some of the ways in which architects disparage their profession. It is the misfortune of that profession that its prizes, instead of being the accumulations of steady labor, come at intervals, and in such form as to be great temptations to our cupidity. Consequently we are tempted to waste time, money, and labor on the slender chance of a considerable prize now and then, — to gamble, that is. The public see this, and we cannot wonder that they take advantage of it. Until the members of the profession show that they set some value on their own work, it is useless to hope that it will be rated high by others, even if it is thought to be necessary. Until the public sees that architects agree in the matters which they put forward as essential, and that they are not willing to throw away their work, it will confine its faith to the individuals who may secure its favor; whatever it may offer to the profession at large will be at a very low rate, and betoken very little respect. It is in the power of a moderate number of successful architects at any time to raise the standard of professional competition to a position of reasonable dignity. But as a profession, people will not trust us if we disagree, nor respect us if we come begging to them. There is no reason to doubt that in due time the profession will find its level in public confidence with others that are better established; but we may hasten or retard this consummation greatly by our direct efforts.

STUDIES OF INTERIOR DECORATION.

V.

Our present concern is to indicate the methods by which we are to form a consistent theory or ideal of interior decoration in any given case. We desire to prove that except by a happy accident, no such decoration can be good and fitting unless it is based upon an ideal, and that this ideal is not a caprice or a fashion, or a *parti pris*, but a deliberate development by analytical process of the peculiar capacity of the subject for decorative treatment, or rather for *completion* in the sense of exactly fulfilling all that can be required of it as regards both use and sentiment. We do not propose to be dogmatic as to the language with which this ideal is to be expressed. It may be set forth in poetry or prose, with dignity or playfulness, with circumstance and splendor or with simplicity and reserve, with many words or with few. The expression must be left to the inspiration or opportunity of the designer; but he owes it to the dignity of architecture, of which such decoration or completion is an essential part, that he shall have an idea before he speaks.

Now it is an important fact that in all probability, no two rooms ever existed exactly similar in all their requirements, conditions, and capacities. If they do not differ in respect to size, shape, relative proportions, construction, material, or usage, they will present some other feature of individuality, whether in the disposition of doors, windows, or chimney, in outlook or aspect, or in some contrast or relation to be observed with adjoining rooms.

This phenomenon implies that the ideal treatment in each case cannot be ascertained without close observation and a very nice appreciation of the conditions. It is rarely to be reached by inspiration, intuition, or instinct. This ideal when formed is a positive result, and must differ essentially from the ideal of any other room whatsoever; but each ideal in itself, as we have seen, is capable of innumerable expressions. The theme being thus defined, the designer, in the interpretation of it, is left in that condition of perfect freedom under which alone art is possible. Hence the charm of infinite variety and the delight of constant surprise.

Let us attempt to define by another familiar example the difference between the formation and the expression of an ideal in decoration.

In Plate IV. we present plans of the two principal stories of a city house facing the north, and having the following distribution of rooms: —

1, porch; 2, vestibule, 8′ x 8′; 3, entrance hall, 8′ x 18′; 4, staircase hall; 5, service stairs; 6, butler's pantry; 7, drawing-room, 16′ x 38′; 8, dining-room, 16′ x 22′; 9, chambers; 10, dressing-rooms and cabinets; 11, bath-room; 12, wardrobes and closets; 13, area for air and light.

The entrance and staircase halls are continuous, and form a corridor eight feet wide and thirty feet long. The principal story is twelve and a half feet high. The staircase hall expands in the second story around a well admitting the light from above into the rear of the first story halls. The rear of the drawing-room is lighted by a skylight through a well which supplies the inner rooms above with light and air.

The halls and the drawing-room are so closely connected that we shall find it most convenient to consider them together. They all have an excess of length over width, and the first *motif* of our scheme of decoration must evidently be to correct this disproportion. This result can only be obtained by dividing the longer dimension. The chimney-breast of the drawing-room is in the centre of one of the long sides. The ideal position for the main door of this room is the centre of the opposite side, so that to one entering the apartment, its disproportionate length may appear divided in halves, and either end of it may be equally accessible. This arrangement moreover facilitates the establishment of a transverse bay across the room from chimney-piece to doorway, and thence continuously across the entrance hall. The transverse feature thus obtained should be made as important as possible, so that by drawing attention to one dimension, we may counteract the undue predominance of the other. The chimney-piece, the natural point of interest in the drawing-room, forms one end of this transverse bay; the other end in the hall should have a piece of furniture appropriate to the position, and important enough to balance the chimney-piece. These two features should have mirrors to increase the apparent transverse length as much as possible; and that these mirrors may have their due effect one upon the other, the doorway should be as wide as the bay and especially high.

As regards the hall however, this transverse bay, in whatever manner it may be expressed, seems somewhat arbitrary until we shall have established other transverse bays there. The conditions are such that we can divide the hall into four such bays, thereby distinguishing the entrance hall from the staircase hall by an architectural treatment, and dividing the inordinate length into parts which have their *raison d'être* in the natural dispositions of the plan. The entrance hall should be so treated as to color that it may form a proper vestibule and preparation for the drawing-room, which, we are to assume, is to be made elegant, bright, and attractive, without affectations of any kind whether of color or form. In approaching such a room, the eye should be occupied by sober and quiet effects of color in order to increase the surprise of the contrast. But the hall is too closely associated with the drawing-room not to be treated as richly as is consistent with these qualities of soberness. This supplies us with another method by which this hall is to be distinguished from the staircase hall; for, as a treatment of such sober elegance as we propose would become vulgar and redundant if continued along the staircase hall and thence up into the second story, we must needs establish a distinct line of demarcation, against which the peculiar wall treatment of the entrance hall may stop and that of the staircase hall may begin. This is obtained by pilasters of wood supporting a beam on a line with the well of the stairs, thus indicating the manner of expressing all the transverse bays of the entrance hall; but the beam forming the division between the two halls, as it has an especial function, should receive an especial treatment.

The contrast of color treatment between the two halls should be different in its character from that between the entrance-hall and drawing-room. As the line of demarcation between these two halls is somewhat arbitrary, we should use every means to make it as sharp and distinct as is consistent with harmony. As the staircase hall serves as a vestibule to various chambers, each of which, to be properly completed, must take upon itself a certain individuality of color, its walls should be cool in tone, very quiet, very neutral, and light enough to reflect well. Those of the entrance hall on the contrary, as it borrows a sufficiency of light, should be dark, rich, detailed, and absorbent. Both halls should have a high panelled wainscot to protect the walls from injury; and to assist in correcting its inordinate height, the walls of the entrance hall may be treated with a screen and frieze, respectively dark and light.

The parlor chimney-piece with its mirror is balanced by the mirror and hall-table at the other end of the principal transverse bay. The material of which these two pieces of furniture are constructed should be the same in order that their necessary relationship may be more distinctly defined. This seems to require the use of the same wood in halls and drawing-room. We choose black walnut, polished light with shellac or wax, and rubbed down to a dead finish, as equally suitable in both places. A lighter wood would not be so rich and warm, and would not combine so effectually with the light, warm, and reflecting tones which we find desirable in the drawing-room, or with the dark treatment of the walls outside.

The pilasters in the hall being of wood, it becomes necessary to treat the transverse beams with the same material; and as the passage is naturally too high for its width, we can afford to give great depth to these beams, framing in the panels thus formed in the ceiling with a wooden cornice of bold projection separated from the ceiling by a space of three or four inches, thus creating a shadow around the panels or caissons, and contributing materially to the effect of weight and to the depth of color which it is necessary to realize in this place.

We have thus, by considering the local conditions, worked out an ideal of decoration for the two halls. We have discovered that the leading *motif* is to decrease their excess of length by giving to each a different treatment, the entrance hall being distinguished by transverse bays and a deeper color, and separated from the staircase hall by an emphatic line of demarcation. We have also to decrease the excess of height by deep beams and a frieze; and both halls are to have a high panelled wainscot of black walnut.

In Plate IV., fig. 3, we present one expression of which this ideal is capable. In this sketch the line of demarcation between the two halls is treated as an open screen, the details of which are defined as dark against light to one entering the house. The principal element of this screen is its open frieze consisting of a row of stunted columns which are repeated from the corbelled columns supporting the ends of the transverse beams. The frieze thus emphasized in the lines of construction is indicated on the wall-surface in salmon color decorated with figures in red and green. The screen below is in Pompeian red with border lines of black and buff.

The panels of the ceiling bear the lighter tones of the walnut beams with lines of red defining their outline, and enriching the effect. Over the wainscot is a narrow belt of dead black, thus conspicuously placed in order to develop the yellowness of the wood, and by contrast with the other colors to give life and spirit to the composition. The droplight is in brass. The walls of the staircase hall received a treatment of blue-gray with borders made up of shadow belts and narrow lines of soft red.

In fig. 2 is presented a study of one side of the entrance-hall, showing the general expression of the wall-treatment; also exhibiting the mirror and hall table which mark one end of the main transverse bay, and balance the mirror and chimney-piece which constitute the drawing-room end of the same bay.

We shall next attempt the development of a consistent theory for the completion of the drawing-room as shown in this plan.

H. V. B.

THE ILLUSTRATIONS.

MORELAND-STREET CONGREGATIONAL CHURCH, BOSTON, MASS. J. H. BESARICK, ARCHITECT.

(32 Pemberton Square, Boston, Mass.)

THIS church and chapel were erected in 1876. The walls are built of Roxbury stone, with yellow sandstone belts, etc. The inside finish is of ash. It has an open-timbered roof. It will seat eight hundred persons, and when the chapel is added to it, which can be done by opening large sliding-doors, it will seat eleven hundred. It cost $50,000.

INTERIOR DECORATION. — IV.

See preceding article.

PROPOSED CHÂTEAU ST. LOUIS, QUEBEC, CAN. W. H. LYNN, ARCHITECT.

See succeeding article.

PROPOSED QUEBEC IMPROVEMENTS.

QUEBEC is Canada's ancient capital. It was the capital as well as the starting-point of Nouvelle France. To all Canadians, at least, its picturesque scenery and historic renown make it powerfully attractive. New England too has points of contact with this city through some of the most stirring episodes in her colonial history. And Quebec is one of the few cities in Canada in whose history memorable deeds are not few nor isolated, — deeds bearing with them such names as Jacques Cartier, Roberval, Champlain, Frontenac, Montcalm, Wolfe, Montgomery, and Arnold.

A glimpse of these things, in passing, is all that concerns us. What we desire to note is that in the autumn of 1875, the Earl of Dufferin, then and now Governor-General of Canada, developed a scheme for the improvement of the city of Quebec without interfering unduly with the ancient fortifications. This scheme contemplated, —

1. A prolongation of streets through the walls.
2. An enlargement of the Esplanade, together with the formation of ornamental grounds outside the walls, and connected with the Esplanade by sallyport.
3. A continuous line of promenade along the walls and outside the Citadel.
4. A new Château St. Louis to be erected in the Citadel.
5. *Tourelle* additions to present walls at various points.

On his Excellency's submission of the scheme, the City Council

1877.

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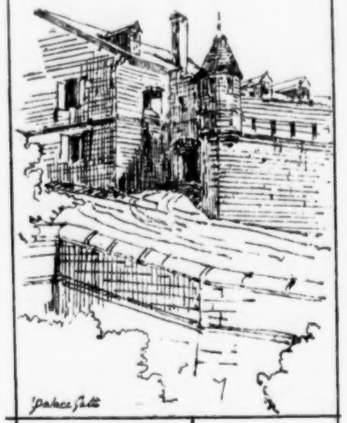
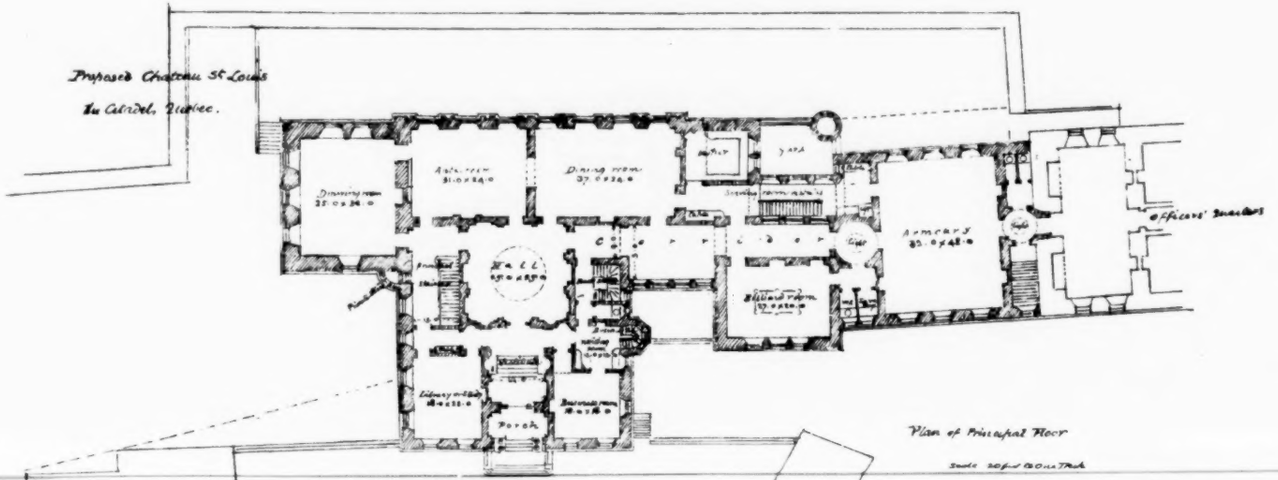
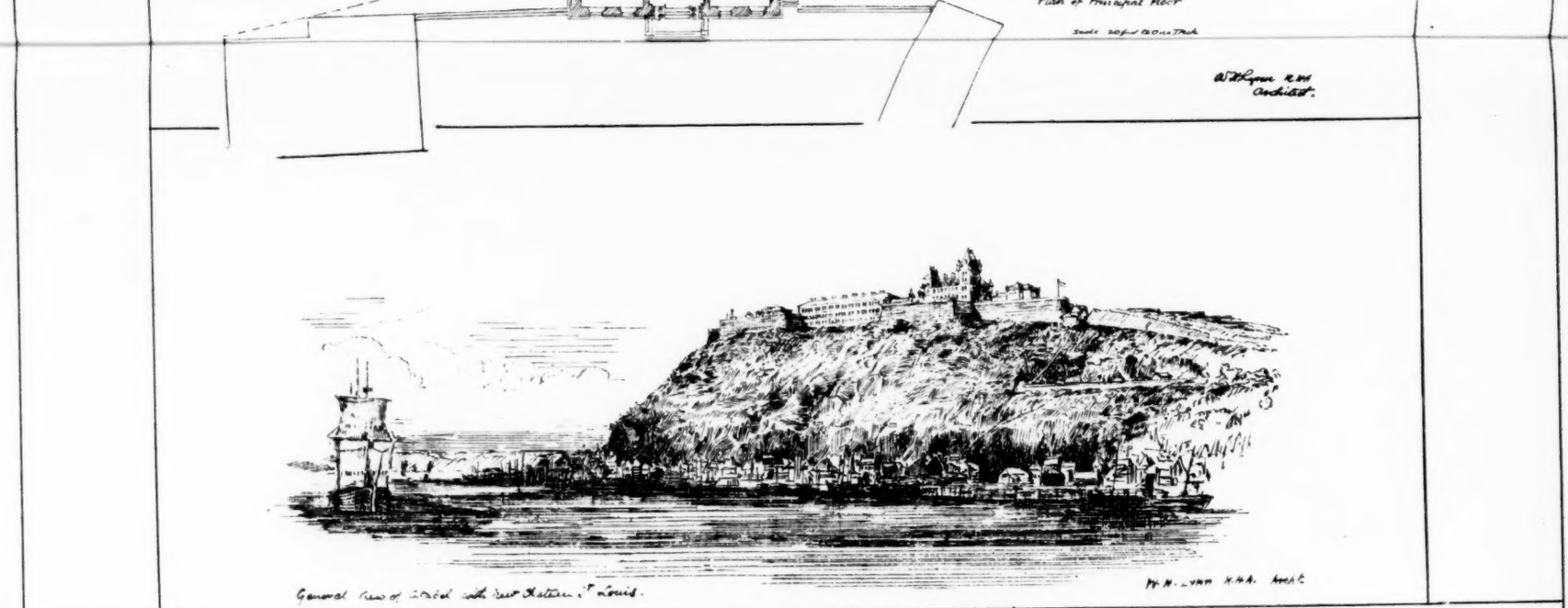
Palace Gate W.H. Lyon R.H.A. Archt.

New Chateau St Louis in Citadel W. H. Lyon R.H.A. Archt.



Palace Gate



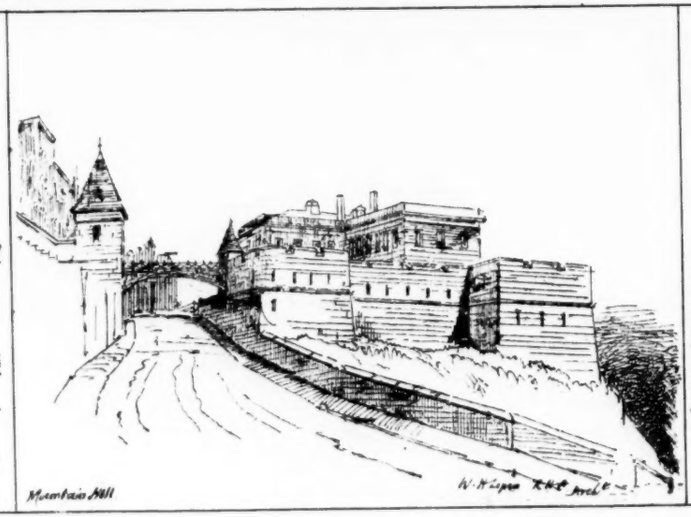


General view of Citadel with West Station. St Louis.

W. H. Lynn R.H.A. Archt.

St. John's Gate.

W. H. Lynn



Mountain Hill

W. H. Lynn R.H.A. Archt.

St Louis Gate.

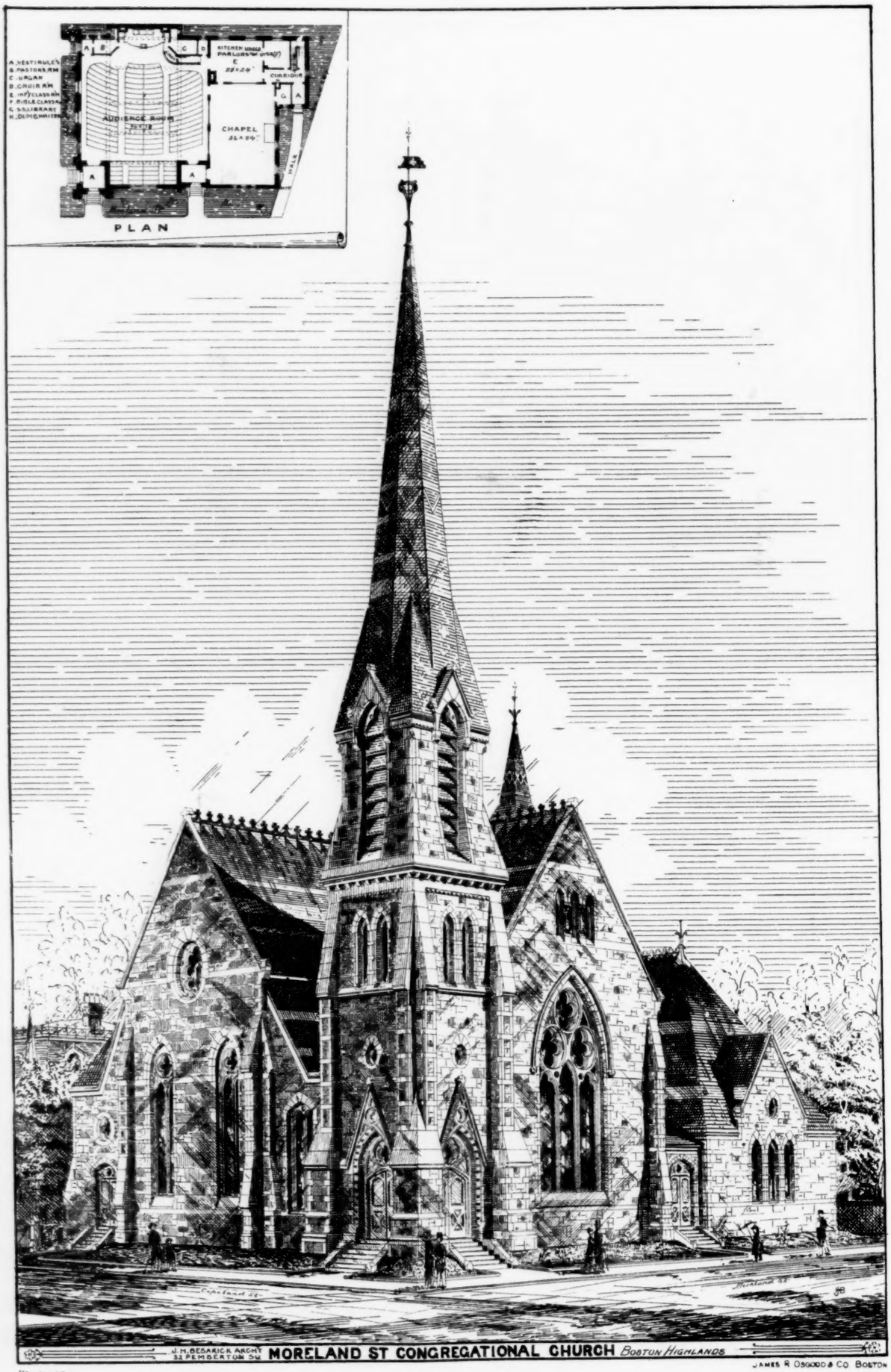
W. H. Lynn R.H.A.

HELIOTYPE

JAMES R OSGOOD & CO BOSTON

PROPOSED CHÂTEAU, ST LOUIS, QUEBEC.

DESIGNED BY W. H. LYNN.

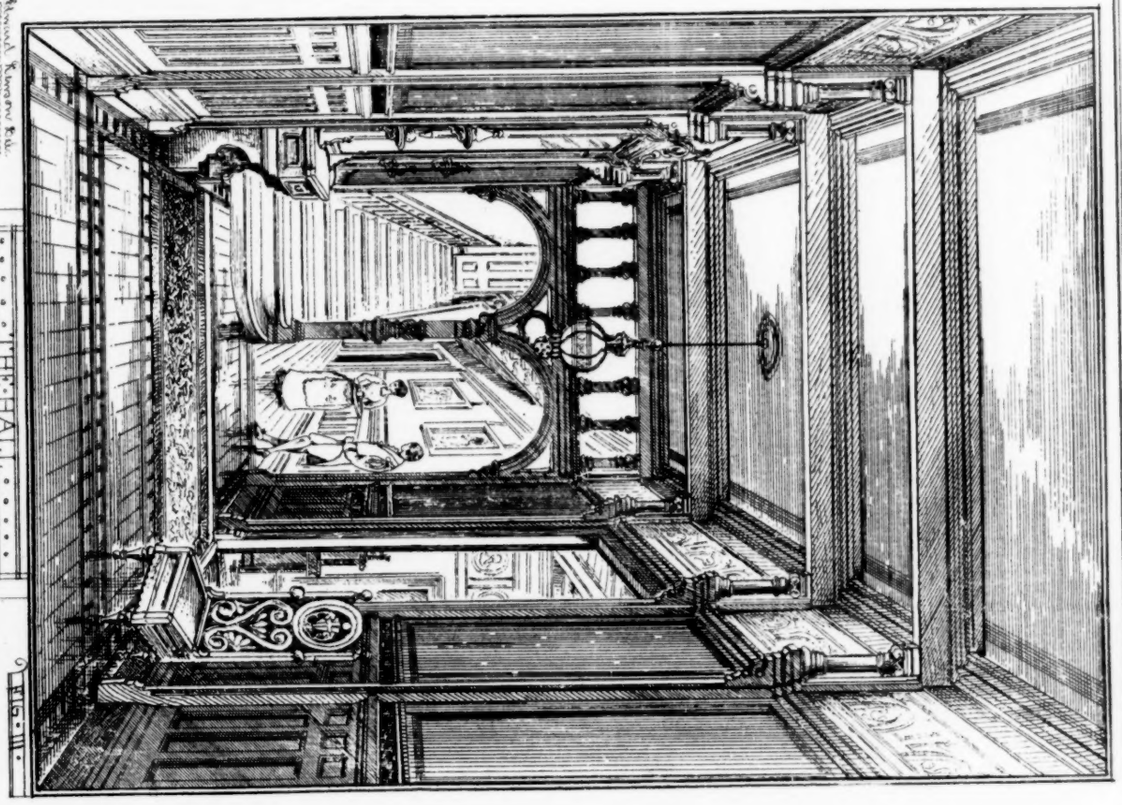


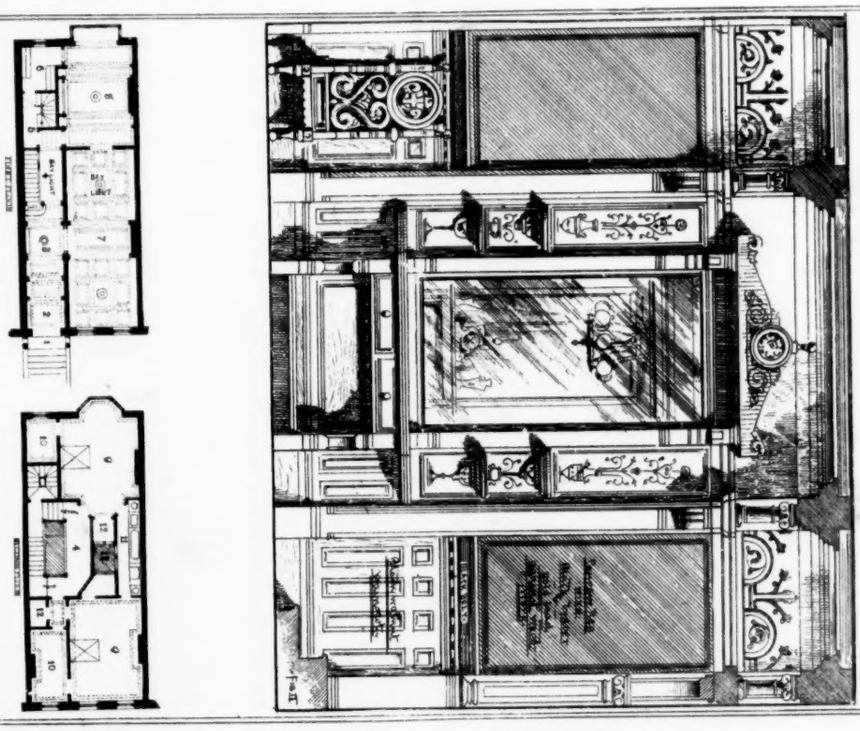
HELIOTYPE

JAMES R. OSGOOD & CO. BOSTON

STUDIES OF INTERIOR DECORATION. PLATE IV.

THE HALL.





H. Van Brunt, Architect.

of Quebec expressed themselves highly pleased with it, and immediately voted $30,000, which the Provincial Legislature of Quebec supplemented by $93,500; and the aggregate of these was thought ample for the construction of gates and thoroughfares, the citizens hoping that the Dominion Government would find the necessary funds to build the new Château St. Louis, considering its intended use as an occasional vice-royal residence.

From the fact that the sketches we publish are rough copies of the entire series of Mr. Lynn's pencil-sketches (save only a plan), it seems natural to suppose that in executing the working-drawings these will only be taken as suggestive.

As being somewhat explanatory, as well as its giving us the opinion of a gifted art amateur, we make an extract from the published speech of H. E. the Earl of Dufferin, delivered at a banquet tendered him by the Mayor and City Council of Quebec, on 21st June, 1876: —

"I can assure you it has been with the greatest pleasure that I have learned that there is now every prospect of our being able to carry to a successful conclusion the scheme which has been set on foot for the restoration and for the embellishment of the ancient city of Quebec, — a scheme which combines a due regard for the growing exigencies of your increasing traffic, by the widening of your thoroughfares, and the multiplication of your modes of exit and entry. In doing this you are, after all, doing that which has been done by every municipality in Europe which has had the good fortune to find itself placed in similar circumstances, and who are wakening up to the desirability of preserving with pious care the memorials of the past. But if this duty is imperative on the other side of the Atlantic, how much more incumbent is it on us to maintain the only city upon this continent which has preserved the characteristics of its early days, — a city whose picturesque architecture and whose noble battlements present a spectacle the like of which is not to be found between Cape Horn and the North Pole! For, Mr. Mayor and gentlemen of the Town Council, let me remind you that you do not hold Quebec merely for yourselves, you do not even hold it in the interests of the people of Canada; but you are the trustees of Quebec on behalf of civilization, and all the inhabitants of this continent. Who but would regret the ruin and degradation of its walls as an irreparable outrage and as a common and universal loss? But happily there is no danger of any such devastation being perpetrated. Far from laying a suicidal hand on those rivals of time, you are preparing to repair, to guard, and to adorn them; and sure am I that in future ages, when a maturer civilization shall have transformed Canada into what it is not possible to imagine or conceive, a grateful posterity will hold in veneration these wise ediles who have preserved intact the sacred memorials of their country's history, — memorials which the passing century will invest with an ever-deepening glory of interest and splendor. For, Mr. Mayor, that which you are engaged on here is observed by our fellow-countrymen at home. No sooner was it known in England, that the citizens of Quebec were about to repair their fortifications, than the Secretary of State for War, as the spokesman and representative of the empire, wrote to inform me that he intended to express his own admiration, and the admiration of the soldiers of England, with what was being done here, and was going to the British House of Commons and asking them — and they would receive the proposal with the most enthusiastic acclamation — to vote a sum of money to be expended in the decoration of whatever point along your walls might best connect itself with the memory of those illustrious heroes, Wolfe and Montcalm, whose deeds of valor, and whose noble deaths in the service of their respective countries, have brought lustre upon the respective nations for which they contended, and whose outworks they watered with their blood.

"But, Mr. Mayor and gentlemen, the news of what you are about to do touched the heart of even a more august personage than the Secretary of State for War, — the Queen of England herself. No sooner had she learned what was undertaken, — she who takes as deep an interest in every thing that passes in her remotest colonies as she does in what happens within a stone's-throw of her palace, — than she told me to convey to you, Mr. Mayor, at an early opportunity — and what better opportunity could I take than the present? — her warmest sympathy, and her entire approbation and approval of what you have undertaken. And she further has commanded me to inform you that it is her intention to present your good city of Quebec with one of the new gateways with which your city is to be repaired [enthusiastic applause], in order that she may be personally associated with you, and with your colleagues, and with the city of Quebec, whose liberality and patriotism have induced you to engage in this work. And she further desires that the gateway in question be connected with the name of her illustrious father, the late Duke of Kent, who retained up to his dying day so grateful a recollection of the kindness and the courtesy he had received at the hands of its inhabitants. But, Mr. Mayor, this would not be a proper occasion for me to go into any of the details in connection with the work. I have the greatest confidence in the good taste, in the discretion, and in the architectural skill, of those with whom the decision of these points must ultimately rest. There is one leading idea however which I trust will be kept in prominence, and which in my opinion ought to direct and determine all the subordinate arrangements; and that is the construction of a continuous pathway for pedestrians, beginning at Durham Terrace, and running around the foot of the Citadel, next by the Esplanade, the Artillery Barracks, Palace Gate, and so behind the present Parliament Building, across the street, and back again by Durham Terrace. If you succeed in creating such a pathway as I have described, you will then have that which will not be paralleled either for commodiousness, for the innumerable points of view which will be commanded by it, or for safety and tranquillity, in any capital in Europe. And, Mr. Mayor, I must also congratulate you upon the fact that you have at your disposal a quarry of smooth and well-cut stone in those various unnecessary outworks which are to be found beyond the *enciente* of your city. This will be found amply sufficient both to repair the dilapidated portions of your bastions and as materials for the projected gateways. But I trust you will pardon me if I venture to convey to you a word of warning. I trust that in making use of these materials you will not fall into the mistake which was made by a friend of mine in Ireland.

"The nobleman to whom I refer had a castle, which in ruder times had been the residence of his family, but had now become a ruin. Observing from day to day that it was subject to various depredations from mischievous boys, and cattle and donkeys, he instructed his agent to protect it with a wall; and having given these orders, he went to England. On his return he went to ascertain the result of his orders. The agent assured him that his commands had been properly carried out; but what was his dismay upon arriving at the site of his castle, to find indeed a beautiful, broad new wall, but the castle itself levelled with the ground! the agent having pulled down the castle in order to use the materials for the wall."

THE CLOCK OF BEAUVAIS CATHEDRAL.

Just before the Franco-Prussian war M. Vérité, a well-known French engineer, completed for the cathedral of Beauvais one of those complicated clocks such as form for the common sight-seer the chiefest attraction of Strasbourg, Lubeck, and Lyons. In accuracy of performance this clock, one of the most wonderful pieces of mechanism that the present century has produced, is expected to surpass any of its prototypes. What the history of its undertaking was, or how long it took to construct it, the *Builder* does not tell us; but that it took both time and money may be taken for granted, in view of the intricate calculations that must have been made — for all the wheels and pinions must be in exact geometrical proportion to each other — in order to lay out the work for the score or more of different classes of artists and artisans who were needed to make the seventeen hundred different pieces of which the clock is composed.

The clock at Beauvais, unlike the Strasbourg clock, is in a single and self-contained structure, a tower sixteen feet broad, nine feet deep, and forty feet high, made of walnut wood. The principal façade is in the Romanesque style, and its chief feature is an arcade of three bays surmounted by the great dial about five feet in diameter, which takes the place of a rose window. The mouldings used are characteristic of the style, and all the woodwork is richly sculptured, the tympana and niches being filled with allegorical representations of the world, time, the four ages of man, the seven deadly sins and the like number of cardinal virtues, angels, devils, and figures emblematic of the hours and seasons, and above all the Saviour. Among its scenic attractions, which, even if it prove untrustworthy as an accurate horological instrument, will always make it an object of interest, is a cock which just before each hour flaps his wings and crows; while at the striking of the hour the various figures start into action, and go through their allotted motions. The façades are ornamented with gold and color so as to produce an effect at once grand and gorgeous. The clock itself has forty-nine dials of different sizes, each devoted to chronicling a different series of temporal or astronomical events.

The motorial system consists of one principal and fourteen secondary motors with their respective clock-trains. The chief motor communicates movement to hands that indicate time on more than twenty different dials, — to the sun and moon on the solar and lunar dials; to the hands that mark sidereal time; to two planispheres, or projections of the celestial sphere on the plane surface of the dials; to the rotating dial that shows the eclipses of the sun; to the hands of the repeating dial on the reverse face of the clock; and to the hand of the seconds dial.

The Beauvais clock is more completely a mere clock than is the one at Strasbourg, which is at once a clock and an orrery, and aims at indicating such impossibilities as the precession of the equinoxes, which accomplish their revolutions in periods of 25,920 years. Yet many of the dials upon the Beauvais clock are devoted to indicating such of the planetary movements as may from their comparative simplicity and limited periodicity come within the scope of the astronomer accurately to determine, and the power of the mechanician to visibly interpret. On the main dial is shown the ordinary division of the day into hours and minutes, the circumference being divided into two halves of twelve divisions each. Occupying the central bay of the three immediately below the main dial is a group of eleven dials arranged around a twelfth dial as a

centre. This central dial has five concentric circles, to the letters or figures on each of which points a separate hand, which indicate the notation of the ecclesiastical computory. Thus the outermost circle marks the twenty-eight years of the solar cycle, at the end of which period the year begins upon the same day. The second circle shows the dominical or Sunday letter for each of the twenty-eight years. The third circle shows the golden number that marks the lunar cycle of nineteen years, at the end of which period the new and full moon coincide. The fourth circle shows the day of the epact or number of eleven days that are added to the lunar year to make it correspond with the solar year: as once in three years the number of epact days exceeds twenty-nine, a lunar month must be intercalated, and this makes the lunar and epactic cycles coincide. The fifth circle marks the year of the current indiction, a period of fifteen years, in accordance with which the Roman emperors dated their acts, and, at the present day, the Popes date their briefs and encyclical letters. On the 31st of December the motor governing the movement of this dial acts, and the five hands indicate a fresh set of letters for the new year.

Dial No. 2 of this group marks the hours of the unvarying sidereal day of 23 hours, 56 minutes, and 4 seconds. Dial No. 3 shows the solar equation, or the difference between mean and true time, as measured by two successive transits of the sun's middle across the meridian. Mean and true time coincide on April 15, June 15, Sept. 1, and Dec. 24. Dial No. 4 indicates the declination of the sun to the north or south quarter of the heaven. Dials Nos. 5 and 6 show the lengths of days and nights in the latitude of Beauvais. Dial No. 7 shows the four seasons of the year. Dial No. 8 shows the time of the sun's entry into each sign of the zodiac. Dials Nos. 9 and 10 show the time of sunrise and sunset on each successive day. Dials Nos. 11 and 12 show the day of the week, and the nominative planet of each day.

Dial No. 1 in the left-hand one of the three bays, images the actual phenomena of sunrise and sunset. Besides this there is a group of eight dials arranged around a ninth dial, showing meridian time at Paris and at eight places west of Paris, — London, Amsterdam, Bordeaux, Lisbon, Montreal, New York, Mexico, and Rio Janeiro. Dial No. 3 gives the year, the day of the year and its patron saint, the months and the number of days in each month; it also shows the leap-years, and the secular bissextiles when the century begins with a leap-year. Three minor dials within its circumference show the phases of the moon, its age, and the mean time of its transit over the meridian of Beauvais.

In the right-hand one of the three arcades is a dial imaging the movements of the moon. A group of nine dials shows meridian time at nine places eastward of Paris, — Rome, Berlin, Stockholm, St. Petersburg, Warsaw, Florence, Vienna, Naples, and Lyons. Dial No. 3 represents the calendar of Easter and the feasts depending on it for the next three hundred years. This dial also has within its circumference three lesser dials showing respectively the year of the world according to the Mosaic chronology, the millennial number of the current year, stating whether it is leap-year or not, and the third shows the current century, indicating also the secular bissextiles.

One of the dials on the right-hand lateral face of the clock represents the solar eclipses (lunar eclipses are nowhere indicated). No. 2 shows the rise and fall of the tide at Mont St. Michel on the coast of Brittany. No. 3 shows the northern planisphere on which are represented eighty-six constellations, four thousand stars, and more than five hundred nebulæ, carefully graduated according to their magnitude. This dial with its accessories indicates the aspect of the heavens at each instant of mean time; the rise, course, and setting of each star; the period of a star's presence or absence above the horizon; and the circumpolar stars. Some of the dials on the left-hand lateral face correspond to those just mentioned, and represent, one the southern planisphere with its stars and constellations; another the rise and fall of the tide at the island of Jersey; and another shows the orbital movement of the seven principal planets, Mercury accomplishing its revolution in eighty-eight days, and Saturn its revolution in twenty-nine years.

As we have said, motion is imparted to this intricate system of wheel-work by one principal and fourteen secondary motors, the greater part of whose machinery is made of brass. The pendulum which regulates these forces weighs a hundred and fifteen pounds, and in order to insure its uniformity of action the main rod is composed of five rods of steel and four rods of copper. The bob could not be attached to this main rod in the usual way, as the space needed was occupied by an apparatus called the *remontoir d'égalité*, invented by M. Vérité, which regulates with the utmost exactitude the constancy of force and regularity of action of the whole system. In order therefore to attach the bob to the main rod, it is grasped at the two extremities of its horizontal diameter by steel rods inserted in cylinders of copper, which have their lower extremities resting upon cross-bars attached transversely to the upper system of compensation, leaving the bob and the rod distinct unities, and determining the length of the pendulum and consequently the arc of its vibration, with the nicest mathematical accuracy against all variations of temperature.

The motion of the clock is kept up during the process of winding by what is known to English clock-makers as Harrison's going-barrel.

The cost of the clock was about $500,000, of which about $17,500 were needed to complete the case. All the money was raised by subscriptions.

THE DRAINAGE OF COUNTRY HOUSES.

NEWPORT, R.I., March 26, 1877.

EDITOR AMERICAN ARCHITECT AND BUILDING NEWS.

I trust that your readers are not tiring of this discussion, for — unlike Mr. Bayles — I think it quite as appropriate, even in its agricultural details, to an architect's as to a farmer's paper. The question as to the action of the soil, and of the air which it contains, upon organic impurities added to it, is equally important whether we are considering the effect of this action in preparing food for plants, or in removing conditions dangerous to health. It has its sanitary side, and so claims the attention of the architect, — the practical sanitarian.

It is to be understood that what I propose is not a "soakage" system, but something that stops so far short of saturation that in an extreme case, as per my communication on p. 55, only about one volume of liquid is added, per day, to over three hundred volumes of earth. The importance attaching to the soil as an agent of disinfection is due to its known powers of absorption and to the oxidizing effect of its contained air. "Satisfactory evidence of the fact that oxygen is concentrated in the soil" is to be found in the recorded testimony of many investigators in the field of agricultural physics. Prof. Johnson, of New Haven says,[1] "The soil being eminently porous condenses oxygen. Blumtritt and Reichardt indeed found no considerable amount of condensed oxygen in most of the soils and substances they examined; but the experiments of Stenhouse and the well-known deodorizing effects of the soil upon fæcal matters leave no doubt as to the fact. The condensed oxygen must usually expend itself in chemical action. Its proportion would appear not to be large; but being replaced as rapidly as it enters into combination, the total quantity absorbed may be considerable. Organic matters and lower oxides are thereby oxidized. Carbon is converted into carbonic acid, hydrogen into water, protoxide of iron into peroxide. The upper portions of the soil are constantly suffering change by the action of free oxygen, *so long as any oxidable matters exist in them.*" Schubler says,[2] "The earths possess the remarkable property of absorbing oxygen gas from the atmospheric air, a phenomenon pointed out many years ago by A. von Humboldt. . . . This property of the earths is confirmed almost without an exception, provided they be employed for this purpose in a moist state." In the experiments which he instituted, exposing one thousand grains of different earths for thirty days in vessels of fifteen inches cubic contents (15 inches of air containing 3.15 inches of oxygen) he found that sandy loam absorbed 1.39 inches of the oxygen, clay loam absorbed 1.65 inches, and garden mould absorbed 2.60 inches. This looks very like concentration. All authorities agree in ascribing this power of condensing oxygen (and other gases) to all materials very much in proportion to their porosity. As charcoal is very porous, this is usually taken as an illustration. Voelcker says,[3] "It [charcoal] possesses the power, not only of absorbing certain smelling gases, sulphuretted hydrogen and ammonia, but also of destroying the gases thus absorbed; for otherwise its purifying action would soon be greatly impaired. It is very porous, and its pores are filled with *condensed* oxygen to the extent of eight times its bulk. We have therefore in charcoal oxygen gas (which supports combustion or lights fires) in a condensed or more active condition than in the common air which we breathe. Hence it is that organic matter in contact with charcoal is so rapidly destroyed. The beauty of charcoal is that the destruction takes place imperceptibly, and that its power of burning organic matter is continually renewed by the surrounding atmosphere, so that it is a constant carrier of atmospheric oxygen in a condensed state in its pores. The oxygen that acts on organic matter and burns it up is speedily replaced, and the process goes on continually. Hence it is that a comparatively small quantity of wood or peat charcoal is capable of destroying a very large quantity of organic matter." Johnson, after describing and illustrating this action of porous substances, says,[4] "The soil absorbs putrid and other disagreeable effluvia, and undoubtedly oxidizes them like charcoal, though perhaps with less energy than the last-named substance, as would be anticipated from its inferior porosity." Jamieson says,[5] "All porous bodies which offer a considerable surface to gases act like charcoal." Saussure says that charcoal absorbs nine and a quarter times its bulk of oxygen. Prof. Way says,[6] "The reason that the sand accelerates the fermentation of the urine is no doubt this: all bodies possess a surface attraction for gases, and of course therefore for common air. This attraction, *which enables them to condense a certain quantity of air on their surfaces*, is in direct relation to those surfaces." Way filtered sewer-water through six inches of soil. In two and a half hours he collected half a gallon which he analyzed. It contained no potash, "no ammonia or nitrogen in any form:" the original liquid contained over three hundred grains to the gallon of

[1] How Crops Feed, p. 218. [2] Journal Royal Agricultural Society, vol. i. p. 197.
[3] Latham's Sanitary Engineering, p. 236. [4] How Crops Feed, pp. 170, 171.
[5] Journal Royal Agricultural Society, vol. xvii. p. 448.
[6] Journal Royal Agricultural Society, vol. xi. p. 366 *et infra.*

"organic matter and salts of ammonia." He found the *absorption* to extend to a weight of sewage-water *more than equal to the weight of the soil*. This, be it remembered, was an instantaneous mixture, with no opportunity for a constantly renewed oxidizing action.

That the soil absorbs the products of the decomposition of organic matter, and carries the decomposition to completeness, no chemist would question. This action is the basis of the efficiency of the earth-closet. In my own experiment, an analysis of the earth and ashes used in earth-closets for six years (probably ten times over) showed that practically all of the eight hundred pounds of solid dry matter estimated to have been deposited during the six years was destroyed by oxidation as completely as it would have been by actual burning in a furnace.

The investigations of Way and Thompson fully determine the *retention* of impurities by the soil, — an action which they ascribe largely to the double silicates.

The porous condition of the soil does *not* favor the escape of gases. On the contrary, in the case of the earth-closet, dry and porous earth completely arrests the escape of gases, as is demonstrated by the absence of smell, and by the absence of chemical reaction. If the quantity of decomposing matter is large and concentrated, gas may be formed in such volume as to force its way through, but *exhalation* does not not occur. It is not claimed that the gases which are most productive of disease are appropriated by vegetation, but that they are destroyed by chemical action, — by oxidation.

The report of Dr. Mouat, on the effect of the use of the earth-closet in the government institutions of India in time of cholera, is conclusive, at least so far as this disease is concerned. [1] All recorded evidence as to the use of the earth-closet in stopping the spread of disease is to the same effect.

I believe that I only "seem" to contradict myself. Loose soils are more freely permeated by atmospheric air, and heavy clays are more retentive of organic impurities presented in solution. The air in the loose soil oxidizes, and the double silicates in the clay have other chemical action. There is air in all soils sufficient to care for the small amount of impurities discharged by a single household throughout the mass underlying twenty-five hundred feet of surface; and there is clay enough to have an important effect even in what is called sandy loam.

The absorptive powers of clay are manifest to chemical tests even when solid lumps of it are penetrated by solutions of nitrogenous matter. I think my statement that "organic matter once seized upon by the soil is never again given up in an unchanged condition," is the statement of an established fact — with the limitation that after the soil is *saturated*, it cannot "seize upon" new supplies until the first supply has become chemically changed. On the Mapes Farm in New Jersey, — where, by the way, I was a pupil in 1853, — the manure was *ploughed* down, and the deposition of organic matter in the subsoil was mainly due to the decomposition of the roots of crops which (like clover) have the power of deep penetration. In the clay subsoil of the richest and oldest garden we find no evidence that organic matter has ever "worked down" into it; on the contrary, we know that, as "organic" matter, it does not do so even in pure sand or gravel.

Of course "there is a limit to the absorptive powers of every thing," — a limit to every thing, in fact, — but that limit in the soil is, in my opinion, far beyond the needs of the case in hand. So, too, the "some extent" of the renewal of absorptive power is more than enough for the purpose. I believe that wells are polluted by filth flowing through porous strata and rock-fissures, not by filth that has once been fairly *absorbed* by the soil.

The quotation from Lissauer applies to *excessive flooding*, not to the limited discharge of sub-irrigation drains. Paragraph (1) seems not opposed to my theory; (2) applies obviously to much greater flooding than is contemplated, as the effluent water at Merthyr Tydvil (less than one-tenth as much land — loose and gravelly at that — as I have recommended being used per head) remains pure after the filter-bed has been used for several years. (3) All soils can be irrigated (with sewage?), but heavy soils may not be so profitably irrigated because they part with their water so largely by evaporation, and thus lose heat. (4) We do not propose to tax the one-hundredth part of the "maximum power of absorption." (5) The limitation of our volume makes this inapplicable to the discussion. Of course the system of sub-irrigation has its limitations, but it is a vast step ahead of any cesspool system.

If the experience of the world is of any value, it is proven that the tight cesspool, which Mr. Bayles advocates, conserves filth under the conditions which are the *most* "favorable to the exercise of its power for mischief." Even eternal vigilance will not stop the putrefaction of its contents. With some experience and observation in such matters, I do not hesitate to express the opinion that the sub-irrigation system may be more nearly left to itself than any other I know about.

In reply to the bashful "Zero" (p. 79) I would say that my "careful watching" and "satisfactory results" have been largely confined to New England, and have compassed much less than a zero temperature. Probably the fact that we occasionally use warm water is precisely the cause of our immunity from obstructions during a frozen condition of the ground. In winter my flush-tank dog-house is packed with litter or leaves which keep out the frost. *How* the water gets away in the frozen ground, I do not know, — probably by thawing the ground. That it does get away, I do know, — 12,000 gallons though it be. I *suppose* that the aëration of the soil while unfrozen continues in sufficient degree for the needed effect while the surface is locked; but this is only offered as a probable supposition, not as a demonstrated fact.

One important feature of Fludder's system was not described. It is a device for nearly closing the inlet in the coldest weather, by a contraction-bar, which in moderate weather opens it to its full size.

I can only answer Mr. Towne's question by repeating the opinion before given, — that the sub-irrigation system is much the simplest, the safest, and the best; and that its cost is really trifling, even where the water from the kitchen sink and laundry trays in the cellar has to be lifted with a pump to the level of the drains. He accepts, apparently without question, the wrongly based objections of Mr. Bayles, and says, "I think it must be conceded that this system cannot be extensively relied on *for use on private grounds*, of small extent, particularly in our Northern States." To offset this, I can point to instances of success on such grounds in such localities, especially to my own, which has worked *perfectly*, winter and summer, for seven years. I have never heard of a case of failure. These examples, supported by the arguments given above, must sustain the claims of the sub-irrigation disposal of liquid house wastes, or those claims cannot be sustained by my advocacy.

Since writing the above I have found in an editorial of the *Agricultural Gazette* (London), of March 19, the following: —

"The astonishing power of an aërated and porous soil and subsoil (our knowledge of which we owe to Dr. Frankland) may be trusted a great deal more than engineers appear to trust it. Mr. Norman Bazalgette labored hard the other evening to prove that Merthyr filter-beds had done nothing like the work which Dr. Frankland had declared them capable of doing. But the answer to his criticism, which was given in the subsequent discussion, seemed to us complete; and as upon it rests the safety of the cheaper method which in the agricultural interest we recommend, we reproduce it here.

"At the close of his clear and conclusive argument on this subject, Dr. Frankland put the matter thus: 'I have analyzed the effluent water from the Merthyr filter-beds when only 230 people drained on to them per acre, and again when 500 and when 1,250 people were draining on to them per acre; and deducting and discounting the dilution by the subsoil water; in the first case it was thirty times as clean and as pure as it needed to be; in the second case it was purified seventeen times more than enough, and in the last case it was still three or four times purer than was necessary. Is it unreasonable then to believe that those filter-beds could have cleansed sufficiently or even more than enough the sewage of three or four times as many as the greatest of these numbers, if only the work had been given them to do?'

"Now we contend that the work was given them to do, and that they did it." Then follows an explanation of the irregular distribution of the sewage over different parts of the ground, showing that although each area of about one acre received its due proportion of sewage, "the quarter of the plat which was next to the carrier had its full work to do from the first and till the last of its six hours' period; but it often was not till two or three hours had elapsed that the quarter farthest from the feeder was even fairly wetted. And thus it was that while it may be true enough that it was only the sewage of 20,000 people that was dealt with by the twenty acres of filter-bed at Troedyrhiew, — being at the rate of 1,000 people per acre, — yet at least one-half, probably much more than one-half, of that beautifully purified effluent water must have come from areas of the filter-bed which were being watered at the rate of 2,000, 3,000, or 4,000 people per acre."

My recommendation for the use of soil for the purification of household sewage was based on a calculation of only 175 people per acre. It is proper to explain that when Dr. Frankland says that the water was made "thirty times as clean and pure as it needed to be," he means thirty times purer than the Rivers Pollution Commissioner's standard of fair potable water.

Geo. E. Waring, Jun.

[1] Twelfth Report of the Medical Officer of the Privy Council, pp. 104, 105.

THE CHICAGO CUSTOM HOUSE.

Chicago.

Mr. Potter, the late Supervising Architect of the Treasury Department, while taking exceptions to one sentence contained in the Chicago letter of March 3, in his communication of the 13th introduces other matters which make a more detailed statement of facts in relation to the Chicago Custom House necessary. There are very few matters connected with the modifications of this building which have "escaped the notice of your correspondent," but some of them it was not thought worth while to recount. In the opinions of many who are competent to judge of such matters, nothing has been done to those foundations which is of any practical utility. The recommendations of the third commission have already been stated in this correspondence. What was attempted to be done and what has been done has not been stated. After the approval of the report of this commission, which was as stated by

Mr. Potter in his communication, he issued instructions with illustrative drawings to the superintendent here to excavate the area all around the building below the concrete, and, undermining it for a distance of one foot from the edge, to fill in the space so excavated with concrete. These instructions were never enforced, but were subsequently withdrawn; and after a new superintendent had been appointed, the recommendations of the commission were carried out as stated by Mr Potter in his communication. Any architect or engineer can readily form an opinion as to whether this method of re-enforcing foundations could be of any practical utility or not, and therefore none will be here offered.

With regard to the knowledge of your correspondent as to what measures have been taken to equalize the weights and lighten the walls, it is only necessary to refer back to the Chicago letter of July 15, 1876, for a description of all that was proposed and done, which was given in what was thought to be at the time a complimentary spirit.

It is a principle with this paper, which is endeavored to be adhered to, to abstain from all personal "reflections," directly and impliedly; and there was not the least intention in the sentence quoted to reflect on the judgment of the gentlemen forming the first commission. The fact that the foundations were "terribly berated" at the time is well known, and that by all sorts of persons and newspapers. We cannot think that the inference which occurs to Mr. Potter was shared by many persons.

Foundations.

THE CENTRAL PARK, NEW YORK.

3d April, 1877.

To the Editor of the American Architect.

Dear Sir, — Carefully reading the section on the Central Park, of the annual address before the Institute, as printed in your issue of the 24th ult., I cannot help thinking that in effect it pointedly denies to Mr. Vaux his due professional record.

I beg therefore enough of your space to say that no one has more claim than Mr. Vaux to the design of the Park or to what in the address is termed "the æsthetic arrangement of the grounds."

As to its distinctively architectural works, during twelve years he made the original studies for them; and his superintendence of their details was personal, direct, and controlling.

Respectfully yours,

Frederick Law Olmsted.

E. AND O. E.

Indianapolis, Ind., March, 1877.

Editor of the Architect and Building News.

Dear Sir, — In your very interesting journal you have on several different times published what was meant for G. W. Bunting, architect, Indianapolis; but you have made it Bunling, Buentig & Co. It is not a very pretty name when spelled correctly, but when it is murdered like the above fashion it is unendurable. Please be so good as to write it G. W. Bunting, or leave it out of your paper entirely, and oblige Yours truly,

G. W. Bunting.

NOTES AND CLIPPINGS.

The New York Court-House Contracts. — In reference to the opinion given on Friday by the Corporation Counsel to the Board of Apportionment, that the Court-House Commissioners had no authority in law to make contracts amounting to a sum greater than the $100,000 for which that board had authorized bonds to be issued, while they had made contracts amounting to $381,478, Commissioner Blackstone stated recently that when the commission had been organized by the law of 1874, there was an unexpended balance remaining of the former commission's appropriation, of between $400,000 and $500,000. Applications had been made and granted first for $5,000 of this sum to pay for architect's plans, and afterwards for $100,000; of which $50,000 has been paid out for work upon the architect's certificates. The Commissioners consider that they would act within the law in making contracts to the full amount of the unexpended balance.

The Great Austrian Picture. — It is said that the report that Hans Mackart's great picture of the Homage of Venice to Catarina Cornaro was purchased by the Philadelphia Academy of the Fine Arts was incorrect. The majority of the directors have always opposed the purchase for sufficient reasons, although these do not involve any disparagement of the work as splendid in color. It is merely on exhibition at the Academy, which pays a liberal price for the use of it.

A New Book. — MM. Firmin Didot & Cie. are going to issue shortly a series of engravings under the title of *Restaurations des Monuments Antiques*, from the drawings prepared and sent to Paris annually by the *pensionnaires* of the *Académie des Beaux-Arts* under the name of *Envois de Rome*. These drawings are mainly restorations of classic buildings, and contain different restorations of the Parthenon, the Erectheum, and the temples of Theseus, of Minerva, and other Grecian buildings; and likewise of the Pantheon, Arch of Titus, Colosseum, Tomb of C. Metella, the Trajan Forum, the Trajan Column, the Baths of Diocletian, the temples of Vesta, Mars, Jupiter Stator, Antoninus, Peace, Venus, etc., at Rome; as well as restorations of remains found in Magna Græcia and in Asia Minor.

The Brooklyn Bridge. — As a matter for convenient reference, we subjoin the following epitome of the principal facts and dimensions of the Brooklyn Bridge: —

Construction commenced Jan. 2, 1870.
Length of river span, 1,595 feet 6 inches.
Length of each land span, 930 feet (1,860 feet).
Length of Brooklyn approach, 971 feet.
Length of New York approach, 1,562 feet 6 inches.
Total length of bridge, 5,989 feet.
Width of bridge, 85 feet.
Number of cables, 4.
Diameter of each cable, 15¼ inches.
Each cable consists of 6,300 parallel (not twisted) steel wires, No. 7 gauge, closely wrapped to a solid cylinder.
Ultimate strength of each cable, 11,200 tons.
Depth of tower foundation below high water, Brooklyn, 45 feet.
Depth of tower foundation below high water, New York, 78 feet.
Size of towers at high-water line, 140 x 59 feet.
Size of towers at roof course, 136 x 53 feet.
Total height of towers above high water, 277 feet.
Clear height of bridge in centre of river span above high water, at 50° Fah., 135 feet.
Height of floor at towers above high water, 119 feet 3 inches.
Grade of roadway, 3¾ feet in 100 feet.
Size of anchorages at base, 129 x 119 feet.
Size of anchorages at top, 117 x 104 feet.
Weight of each anchor-plate, 23 tons.
Estimated total cost of bridge, exclusive of land acquisition, $9,000,000.
Estimated cost of land, say, $3,500,000.
Total estimated cost, $12,500,000.

The Cincinnati Custom House. — The non-arrival of granite from Maine has caused some delay in carrying on work on the Cincinnati Custom House.

The Tramps' Paradise. — While other towns are doing what they can to discountenance tramps, the town of Stamford, Conn., not only opens its hospitable doors to them, but in a more Christian spirit than Mahomet's mountain even proposes to meet the tramps half way, and to this end voted at a recent meeting to erect a wooden building for paupers, to be so constructed that it can be moved from point to point wherever the work of tramps is desirable in breaking stone. This is regarded as cheaper than to move large masses of stone to the neighborhood of a stationary workhouse.

The Mott Fountain. — Twenty-four residents of Eutaw Place, Baltimore, have purchased the large Mott Fountain that stood, during the Centennial, in front of Horticultural Hall. It is thirty-five feet high, has four basins, and throws a central jet of water fifteen feet in air.

One of Wren's Churches. — All the exterior stonework of the church of St. Mary Aldermary has been cut away to the depth of several inches, and has been replaced by new stone. The tower is at present undergoing the same restoration.

An Anti-Restoration Movement. — In pursuance of Mr. Morris's suggestion a society is now being formed for the purpose of preventing the "restoration" of the architectural and historical monuments of England.

The Buried Cities of Central Asia. — The *Athenæum* says an expedition to explore the buried cities of Central Asia is being talked of in Bombay and elsewhere in India. That treasures like those at Mycenæ may be found in the sands of Mongolia is at least possible. If tradition be of any value, — a tradition, too, which has persistently clung to one locality through the lapse of centuries, — the tomb of Ghengiz Khan is yet, with its fabulously rich treasures, to be found (as Col. Prejevalsky was told by the Mongols) to the south of Lake Tabasun Nor. Within the tomb lies a man who seems asleep. Every evening a sheep or a horse is tied near to the spot; and lo! in the morning the animals have been eaten. In three hundred years, say the Mongols, the sleeper will awake, and lead countless hosts of his children to victory and dominion. This old story is said to be circulating more and more widely every year. Then the Mongols say that constantly the drifting sands disclose, here and there, gold and silver treasures, which they have a superstitious dread of touching. The buried cities under the sands of the Gobi are affirmed to be mines of incalculable wealth, guarded by gnomes and fearful spells, while all the deserts around the hidden ruins are peopled by myriads of howling ghosts. The sands of the deserts of Central Asia regularly move and drift from east to west; and even now the eastern borders of deserts are being denuded widely of all soil that can be torn away by the violent winds.

Ancient Monuments. — It is a matter of every-day knowledge that in all ages and countries the ruined structures, whether habitations or monuments, of former generations, have been used by their successors as quarry-grounds for their own purposes. One of the most curious instances of this custom is shown by the almost total disappearance of the Druidical monuments of Avebury, England, which a century and a half ago were much more imposing than the well-known ones at Stonehenge. There were two causes which led to the destruction of these megalithic remains. One was that the Sarsen-Sarsen stone, to use a local name, is unsurpassed as a road-making material. The other was that the stones occupied too much space on the ground, an unpardonable offence in the eyes of the Wiltshire farmer. The means employed for removing them were truly archaic. Fires were kept up around the stones until they were highly heated, when cold water was thrown upon them, shivering the stones in fragments of a manageable size.

Petroleum vs. Candles. — Herr Erismann establishes in the *Zeitschrift für Biologie* the fact that petroleum when burned in a lamp of good construction gives off fewer products of imperfect combustion than either gas, rape-oil, or stearine candles; and that stearine candles having the same luminous power vitiate the air most.